he finds the sulphate to consist of 73·575 of protoxide of lead, and 26·425 of sulphuric acid; and that the former contains 5·274 of oxygen. According to these results, the equivalent number for lead is 103·6.

By experiments with the chloride of lead, which gave very uniform results, Dr. Turner obtained an equivalent number for chlorine, closely agreeing with that calculated from the analysis of chlorate of potash in the experiments of Berzelius, namely, 35·45, but totally inconsistent with the atomic weight assigned to it by British chemists. The accuracy of this result was further confirmed by a careful comparative analysis of the binoxide and bichloride of mercury.

The author next endeavoured to determine the equivalent number for silver, by the analysis of its oxide and sulphuret, but could not arrive at any precision in his results. The equivalent number for barium may be calculated from his analysis of the chloride already published in the paper before alluded to. His investigation of the equivalent of nitrogen was attempted by means of the analysis of the nitrates of silver, of lead, and of baryta; the mean result of which gives 14·15, agreeing very nearly with that assigned by Berzelius. His investigation of the atomic weight of sulphur is not yet completed; but he details several previous steps in this inquiry, which he intends to prosecute on a future occasion. He estimates the equivalent of mercury at 202; a number which he considers as a close approximation.

He concludes by various remarks on the inconsistency with experiment, which is apparent in many of the numbers adopted as chemical equivalents by British chemists; and on the inaccuracy of those numbers which have been employed as elements in calculating the equivalents of nearly all the other elementary substances. The author thinks that Dr. Prout's hypothesis, as advocated by Dr. Thomson, that all atomic weights are simple multiples of that of hydrogen, can no longer be maintained, and that it is at variance with the most exact analytical researches.

May 23, 1833.

HIS ROYAL HIGHNESS THE DUKE OF SUSSEX, K.G., President, in the Chair.

A paper was read, entitled, "Observations of the Comet of Encke, made in June 1832." By Thomas Henderson, Esq., His Majesty's Astronomer at the Cape of Good Hope. Communicated, by Command of the Lords Commissioners of the Admiralty, by Captain Beaufort, R.N., F.R.S., Hydrographer to the Admiralty.

Most of the observations recorded in this paper were made by a circular micrometer constructed by Simms, and applied to an achromatic telescope of Dollond's, 45 inches in focal length, and 3·5 inches aperture, furnished with a portable equatorial stand, capable of being adjusted to any latitude. The magnifying power was about 30, and the radius of the ring was an arc of 1015 seconds. In other observa-

tions, a transit instrument by Dollond was used, which was 10 feet in focal length, and 4·75 inches aperture. For observing the comet, an eye-glass magnifying 86 times was employed.

A paper was then read, entitled, "On the supposed Powers of Suction of the Common Leech." By Thomas Andrew Knight, Esq., F.R.S., President of the Horticultural Society.

From observing the feebleness of the muscular force exhibited by the leech in its progressive movements through the water, the author was led to doubt its possessing the powers of suction that are so universally ascribed to it. A fact which came under his notice above sixty years ago, of considerable loss of blood from the leg following the bite of a vigorous leech, suggested to him the idea that the animal might become filled with blood simply by the injection of its body, in consequence of the impetus with which the blood is made to flow into it from the part bitten ;—an impetus which he imagines may be occasioned by the introduction of a peculiar kind of venom. He considers the irritation which often accompanies the bite of a leech as corroborating this hypothesis : he admits, however, that the inflammation excited by the sting of a bee or a wasp is attended with effects of a totally opposite kind ; for, in that case, the blood, instead of having a tendency to flow, stagnates around the point where the poison has been instilled.

A paper was also read, entitled, "Experimental Researches in Electricity.—Fourth Series." By Michael Faraday, Esq., D.C.L., F.R.S., Fullerian Professor of Chemistry in the Royal Institution of Great Britain.

The author, while prosecuting his researches on electro-chemical decomposition, observed some phenomena which appeared to be referable to a general law of electric conduction not hitherto recognised. He found that an electric current from a voltaic battery, which is readily conducted by water, did not pass through ice : even the thinnest film of ice, interposed in the circuit, was sufficient to intercept all electric influence of such low intensities as that produced by the voltaic apparatus, although it allows of the transmission of electricity of such high intensity as that excited by the common electrical machine. The author ascertained that a great number of other substances, which are solid at ordinary temperatures, do not conduct the electric current from the voltaic battery until they are liquefied. Among these are potassa, protoxide of lead, glass of antimony, and oxide of bismuth ; various chlorides, iodides, and sulphurets ; and also many of the ordinary neutral salts with alkaline bases. In almost every instance the bodies subjected to this law are decomposable by electricity ; and their decomposition can be effected only when they are in a fluid state, and while they are conductors of electricity. The author inquires how far these two properties are connected together, or dependent the one upon the other ; but finds that several exceptions occur to any general proposition that he attempted to establish on this subject.